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PROGRESS REPORT

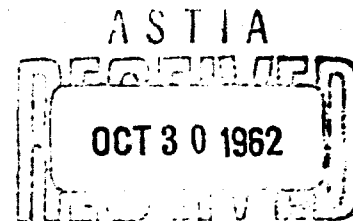
COMPONENTS OF IONIZED IRRADIATED MEATS INJURIOUS
TO REPRODUCTION

July 15, 1962

To: Department of the Army, Office of the Surgeon General

Contract No. DA-49-007 MD-600

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Object: To determine in a 3-year feeding program if ground beef irradiated at a level of 6 million rads contains components injurious to reproduction in the dog. Also, if abnormalities in conception and during the neonatal period are encountered, to determine the precise nature of the abnormality by clinico-pathologic means.

Experimental: Two groups are being studied, as follows:

1. 3 males and 15 females are receiving control beef.
2. 3 males and 15 females are receiving irradiated beef (5.58 megarad).

Registered pure bred beagles between 8 and 10 weeks of age were started on the experiment soon after weaning, on September 19, 1960. The dogs were randomly assigned to the groups after having been divided into littermate pairs where possible. They were examined for physical abnormalities as well as for parasites. Since all dogs were born in our kennel, they were vaccinated between 2 to 15 weeks of age depending on the blood titer of the bitch at the time of whelping. Lederle distemper and hepatitis-modified live virus vaccine was used. Weights were taken and physical examinations given weekly. Parasite and hematological examinations are made at regular intervals.

Electron beam irradiated beef has been used throughout this experiment. Both the control and irradiated beef are being fed as 35% of the dietary dry matter, the remaining 65% being made up of a commercial meal type ration (G.L.F. Big Red Dog Meal). The irradiated beef is stored at ambient temperature while the control is held frozen until the day before it is used. Small volumes of tap water are added to facilitate thorough mixing of the total ration.

Each dog receives orally 40,000 units of A, 4,000 units of D₃, and 400 units of E weekly, at least 2 hours before or after feeding.

Results. The experimental dogs have been continued on the diets according to the original plans. The females were bred as soon after one year of age as they showed estrus. Semen production and fertility of the males have also been checked periodically.

The results to date on reproductive performance are shown in table 1.

Table 1. Reproductive performance of females
during the first reproductive cycle

	Control beef	Irradiated beef
Total no. females on test	16	16
No. never showing estrus	1	1
Percentage of females bred	94	81
No. showing estrus-not bred	0	2
No. bred - not whelped	2	4
No. of litters	11	9
Percentage of bred females whelped	73	69
No. pups born alive	45	34
No. pups born dead	8	1
No. pups alive at weaning	40	27
Av. no. pups weaned per litter	3.6	3.0
Av. no. pups weaned per female on test	2.5	1.7

During the first reproductive cycle females fed the control beef diet showed slightly better performance by all measures than those fed irradiated beef and they weaned more live pups. The differences are not large and may disappear as the experiment progresses. Some of the females have been bred and whelped a second time and others are expected soon. No differences in general health are evident to date, and no anatomical abnormalities were seen among stillborn pups.

After one year of age the males on the experimental diets have been checked for sperm production and characteristics, and they have been used for breeding with non-experimental females in the kennel to check their breeding behavior and fertility. The results to date are summarized in table 2.

Table 2. Reproductive performance of males

<u>Diet</u>	<u>Control beef</u>	<u>Irradiated beef</u>
Number of males	4	4
No. having low sperm counts	1	1
No. refusing to mate	0	1
No. having satisfactory breeding performance and fertility	3	2

To date 1 of 4 male dogs on each diet has exhibited abnormally low sperm counts, and one male on irradiated beef, while showing normal sperm counts and mobility has refused to mate. These three dogs may become normal with more maturity. No important dietary distinction is indicated at present.

The experiment will be continued according to plans, including full observations on health and appearance as well as on reproduction. Any animals that die during the study will be posted for detail observations, and all remaining animals will be examined at the end of the experiment.

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(END)